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ABSTRACT

Focusing mostly on their application for primary schools, this document describes the educational key performance indicators (KPI) employed by the Wendsworth, England, Local Educational Authority (LEA). Indicators are divided into 3 areas, educational context, resource development, and outcomes. Contextual indicators include pupil mobility, home language, and numbers by age group; proportion of pupils entitled to free school meals; and ethnic breakdown of school population. Resource development indicators include overall budget, staffing expenditures, class size, and pupil to teacher ratio. Outcome indicators include pupil attainment measured by reading and mathematics tests, pupil attendance, and pupil exclusions. Additional indicators include equity of resource distribution and gender differences in educational outcomes. Using KPI can help researchers evaluate and compare schools. In addition, the employment of KPI improves accountability by providing governors with a way to ask relevant questions about school management and focuses attention on key educational outcomes of individual pupils. (Contains 11 references.) (JW)

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Key Performance Indicators for Primary Schools

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A paper presented to the
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Bath University, 14-17 September 1995

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Key Performance Indicators for Primary Schools

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Summary

The paper describes the system of educational performance indicators employed within Wandsworth Local Education Authority (LEA). The development and operation of the Key Performance Indicators (KPI) scheme is described, with a particular focus on its application with primary schools. In themselves the indicators are not remarkable and several other LEAs have developed similar sets of indicators. Of greater interest is the way in which the KPI scheme is used to promote school improvement. Simply providing performance indicators (PIs) to schools would not of itself lead to school improvement: measurement of performance does not necessarily lead to improvement in performance. The LEA considers the provision of clear and explicit performance indicators is a necessary but not sufficient condition for school improvement. The second half of the paper describes how the KPI scheme fits into the wider process of school evaluation and review within Wandsworth. The effectiveness of the KPI scheme is enhanced through (i) a research programme explicitly investigating the relationships between PIs to generate targets for schools' achievements appropriate to their particular contexts; (ii) the use of the PIs in the context of a programme of Annual School Reviews (ASR) completed by the Inspectorate. The paper concludes that PIs can enhance the quality of education where they are embedded in a wider evaluative context and are viewed as a vehicle for raising questions rather than providing answers.

Introduction

Wandsworth LEA

This paper describes the approach to educational performance indicators adopted by one local education authority. Wandsworth is an inner-city authority, one of twelve covering the inner London area. The authority is relatively small by UK standards. Recent legislative changes in the UK including the introduction of grant-maintained school status, and a local policy of merging infant and junior schools into all age primary schools, mean the LEA is currently directly responsible for 75 schools; three nursery (age 3-4), 58 primary (age 4-11), three secondary (age 11-18) and 11 special schools (age 2-19).

The LEA has the characteristics of an urban authority and serves a population of approximately 250,000 with higher than average levels of social and economic deprivation. Male unemployment is approximately 14%, 20% of children are from single parent households and 44% of households do not own a car, all figures well

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above the England average. However at the same time the LEA also contains a heterogeneous population of schools. Table 1 presents the borough average on a range of indicators of social disadvantage and ethnic and linguistic diversity, and also indicates the highest and lowest levels across primary schools.

Table 1: Contextual factors for Wandsworth LEA primary schools 1995

	Borough average	lowest school	highest school
Pupils entitled to free school meals	37%	3%	69%
Pupils of ethnic minority heritage			
• Black (Caribbean, African, Black-Other groups)	28%	1%	65%
• Asian (Indian, Bangladeshi, Pakistani, Chinese)	11%	0%	41%
• Total all ethnic minority groups	46%	4%	77%
Pupils with English as a second language	24%	3%	60%
Pupils with Statements of Special Educational Need (SEN)	2%	0%	9%

Source: Wandsworth school surveys 1995.

The Wandsworth key performance indicators (KPI) scheme

The KPI scheme applies to nursery, primary, secondary and special schools, and operates in essentially the same manner across all phases. However primary schools were the initial focus for the KPI scheme within Wandsworth for three main reasons:

- because of the large number of primary schools, and their range and diversity as illustrated in Table 1, a system of PIs had clear organisational and management benefits for the LEA;

- because primary schools are small compared to secondary schools, with a consequently smaller resource base, the support/development role for the local education authority is prominent;

- the majority of work on the development of PIs has occurred in the secondary phase and there is comparatively little research on PIs for the primary phase.

For these reasons this paper will focus in particular on primary schools.

The development of PIs for primary schools was first discussed in the LEA in the early 1990's. A working party of heads and LEA officers, led by the Inspectorate, developed a draft scheme. The scheme was the subject of formal consultation with all headteachers and chairmen of governing bodies in autumn 1992. Following revisions arising from the consultation the KPI forms were officially introduced in spring 1993.

Key principles guiding the development of the scheme

The following key principles guided the development of the KPI scheme in Wandsworth. The scheme should:

- collate in a single document for each school the wide variety of data collected across the Council;
- include key indicators only;
- have a theoretical basis for grouping indicators;
- include time-series data for the school;
- include Borough and national comparators;
- be developmental i.e., open to change and refinement.

The particular indicators employed are summarised in Table 2.

Table 2: Wandsworth LEA - Key Performance Indicators for Primary schools

Context

- pupil numbers by age group
- pupil mobility
- proportion of pupils entitled to a free school meal
- proportion of pupils with statements of Special Educational Need (SEN)
- pupils home language
- ethnic breakdown of school population
- pupil attainment on-entry to reception class (age 4 years)

Resource Deployment

- overall budget, including SEN elements
- staff development/GEST/Curriculum initiative budget
- staffing expenditure
- capitation spending
- class sizes and pupil teacher ratio

Outcomes

- pupil attainment
  - end of Key Stage 1 assessment for 7 year olds
  - reading and mathematics tests for 11 year olds
- pupil attendance
- pupil exclusions

The indicators are grouped into three main areas: context, resource deployment and outcomes. Contextual factors are those over which the school has little or no control but which may be significantly correlated with pupil attainment (e.g., the proportion of pupils entitled to free school meals). The resource deployment section gives a breakdown of the overall budget of the school and indicators of how the school chooses to deploy the resources it has available (e.g., number and type of staff, class sizes, capitation etc.). The final section focuses on pupil outcomes. As well as indicators of pupil attainment in national and local tests, attendance and exclusion are included since the LEA has clear targets for reducing exclusions and improving attendance.

I will not spend a great deal of time detailing these indicators since they will probably be familiar to many of you. However some indicators are worthy of further elaboration where they may be unfamiliar to an international audience or are unique to Wandsworth LEA. I shall illustrate the data with reference to an example KPI form from a randomly selected primary school which I shall call St. Stephen's (not it's real name).

Brief notes on some of the KPIs

Indicators of context

Baseline assessment, as a measure of the educational attainment of pupils on entry to statutory education, is the most important contextual factor. Baseline consists of two parts, a teacher completed checklist of pupils' development and skills in the areas of language, early mathematics and science, and the LARR test of emergent literacy. In the checklists teachers are asked to rate children as 'developing competence', 'competent' or 'above average' in relation to a number of areas. For language this includes listening and responding to stories, naming or sounding letters, use of letter symbols, writing their own name, etc. The LARR test is a standardised assessment of a range of early literacy skills, including whether the child knows that reading relates to interpreting text rather than looking at pictures, whether the child recognises the difference between letters and numbers or has developed an understanding of terms associated with reading such as 'first letter', 'word'. 'top line' etc. Both assessments are completed by the child's class teacher towards the end of the child's first full-time term in school (average age 4.5 years). For those particularly interested in Baseline the assessments and results are described in greater detail elsewhere (Strand, 1995). It is apparent that for St. Stephen's the average level of attainment of pupils on-entry to school is higher than the Borough average, with a particularly high proportion of pupils in the top LARR attainment groups (A and B).

Indicators of resource deployment

This section includes details of the overall delegated budget and the amounts allocated to the school from the 'special needs' part of the resourcing formula (allocated on the basis of pupil attainment, social need and for bilingual language needs). Indicators of how the resources are allocated are given, including the amount spent on different types of staff, capitation etc. The indicators may raise questions about the distribution of spending compared to the Borough average, for example what special circumstances does a school have for an atypical distribution? The most

significant outlay in school budgets (on average some 65% of the total delegated budget) is teaching staff. How do class sizes and the pupil:teacher ratio relate to the borough average?

Indicators of educational outcomes

For those unfamiliar with the national end of Key Stage 1 (KS1) tests for seven year olds, the indicators give the proportion of pupils at different levels of attainment in five areas (English, reading, writing, mathematics and science). The proportion of pupils at the 'typical' level and above (level 2+) in each area are graphed against Borough and England averages. This gives rise to a range of questions such; as is the pattern of pupil achievement consistent over the five curriculum areas, are there any marked improvements or declines over time, and how do the results for the school compare to Borough and England averages?

Supplementary Indicators

It may be noted that the KPI form provides no indicators of equity, for example differences in outcomes for boys and girls, or across groups of pupils of different ethnic heritage. Such indicators are a part of the scheme although not included within the KPI form. In most cases this arises from practical considerations. For example in relation to ethnic origin there are seldom sufficient pupils in any one year group within a primary school to support statistical analysis. Supplementary tables aggregating results over a number of years are therefore completed and provided to schools. Figure 1 presents the ethnic breakdown of the year 6 reading and mathematics results for St. Stephen's. This reveals that, while attainment is above the national average for all ethnic groups, mathematics attainment is relatively low for pupils of Caribbean heritage. Further analysis (not shown) indicated this was predominantly due to the low achievement of Caribbean boys in particular.

<Insert Figure 1 about here>

Schools are also encouraged to supplement the KPIs with indicators of their own choice. The only constraint is that the indicators must be quantifiable. For example one school now completes a detailed annual survey of the attitudes of pupils to teachers, of teachers to the head, and of parents to the school. Another school collates and records the total proportion of pupils receiving additional support for learning and behavioural problems.

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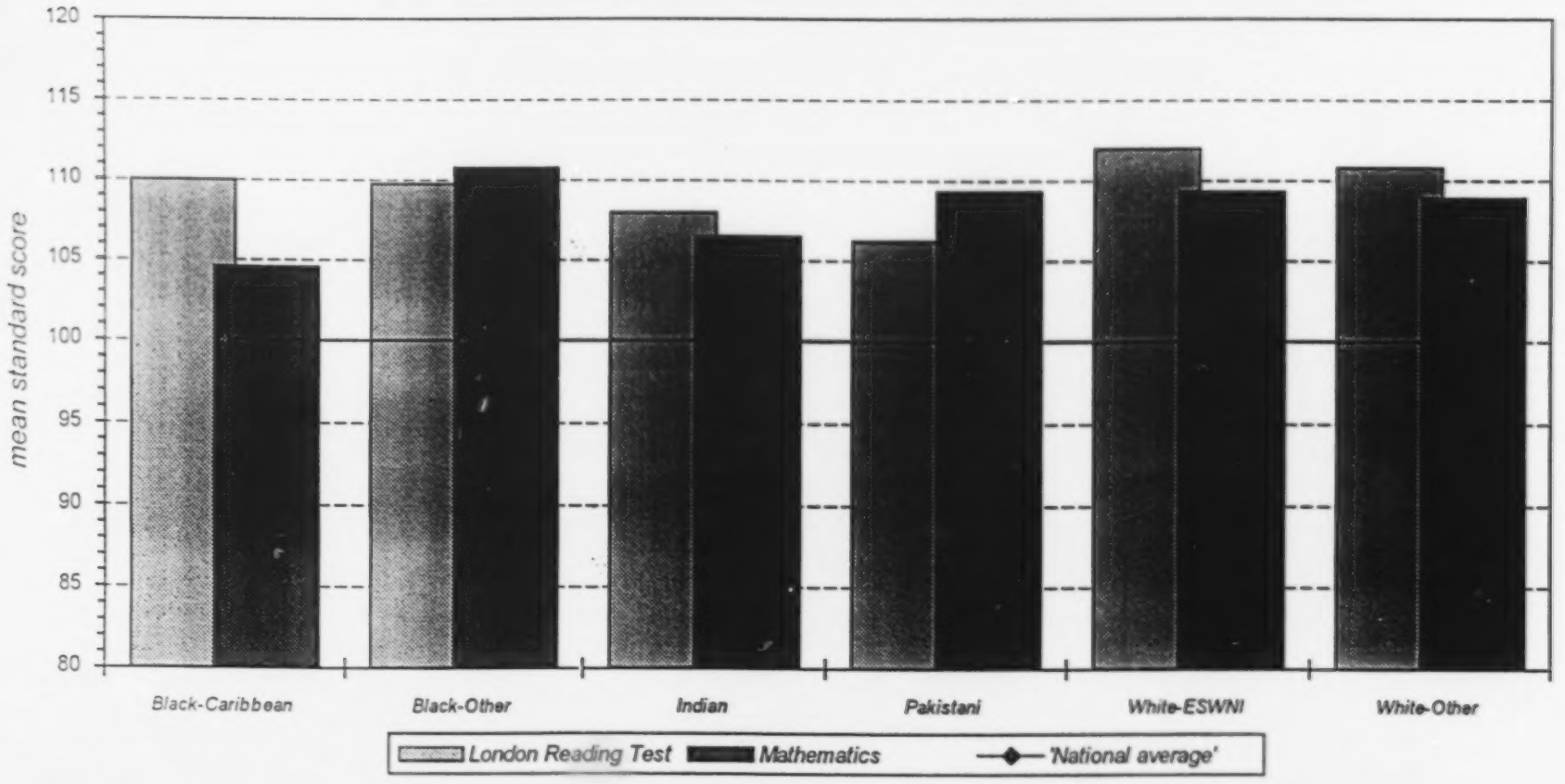
Year 6 test results by ethnic group 1992 - 1994



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A summary of the Wandsworth LEA approach

In reviewing the development of PIs in ten LEAs Riley (1992) broadly classified the approaches into two models, the 'Inspection Model' and the 'Self-Evaluation Model'. The approach of Wandsworth may be described as more akin to the inspection model. The KPI focuses on the collection of high quality audited data from schools to inform inspection and to serve as a management tool for schools in professional, resource and organisational decision making. The emphasis is on the accountability of schools for their performance, and on the contribution of the Inspectorate to improving that performance. I shall have more to say about this process in the next section.

The use of the KPI form in Wandsworth - PIs in a broader context

So far I have concentrated on describing the indicators used. However simply providing these PIs to schools would not of itself lead to school improvement: measurement of performance does not necessarily lead to improvement in performance. The LEA considers PIs are a necessary but not sufficient condition for school improvement. Two areas of further activity form the basis of the LEAs attempt to use PIs to raise standards of pupil attainment. First, a research programme explicitly investigating the relationships between PIs and assessing school effects on these relationships. Second, the use of the PIs in the context of a programme of Annual School Reviews (ASR) completed by the Inspectorate.

The research agenda

The KPIs can tell us that one school has an above average proportion of pupils entitled to free school meals while another has a low proportion of such pupils. They can also tell us that the reception intake in a particular school has above average attainment in basic literacy and numeracy skills. We know that factors such as social disadvantage and prior attainment have a substantial impact on pupils later achievement. However while the indicators quantify these contextual factors they are not capable of telling us whether the schools' outcomes are reasonable given these circumstances. The situation becomes even more complex when considering the impact of multiple contextual factors (e.g., attainment on entry to school, free school meals, language learning needs, pupil mobility etc.) on schools' outcomes. Mayston & Jesson (1988) have made a similar observation:

"Mere inspection of a list of indicators will not typically reveal all the intricacies of their inter-relationships...without a detailed knowledge of the trade off between inputs and outputs ... policy making may simply be confused by these additional data" (Mayston & Jesson, 1988).

A similar problem was inherent in the DES *aide-memoire* (1989) which presented fifty indicators simply organised under a number of conventional headings: basic data; context; pupil achievement; parental involvement; pupil attitudes; and management. In the main the *aide-memoire* seems to be "a rather diffuse collection of statements representing what heads, inspectors, LEA officers, teachers and DES officials collectively understood to be some of the features of 'effective schools' .... a listing of the multiple criteria by which schools *might* be judged" (Gray & Wilcox, 1994). With

no conceptual system to unite the indicators, and crucially no empirical evidence concerning their links, the usefulness of the aide-memoire was severely restricted.

In Wandsworth this question is addressed through a research programme aimed at quantifying the relationship between the indicators, assessing schools' effects on these relationships, and through this process generating targets for schools' achievement appropriate to their particular contexts.

As an example the LEA has provided detailed analyses to schools of their year 6 reading and mathematics test results in relation to 'expected' level of attainment for each pupil. Expected levels of attainment for each pupil are generated through statistical regression of the test results on pupil background factors. The precedent for this approach can be seen in the work of Michael Rutter and others (e.g., Rutter & Madge, 1976). These researchers employed regression equations in which achievement was predicted on the basis of the observed correlations between educational attainment and performance on a verbal or non-verbal reasoning test. In Wandsworth the three pupil background factors making a significant and independent statistical contribution to explaining the variance in pupils reading attainment were the pupils abstract reasoning score, whether the pupil was entitled to a free school meal and the pupil's sex.[2] The results for the reading test at St. Stephen's are presented in Figure 2.

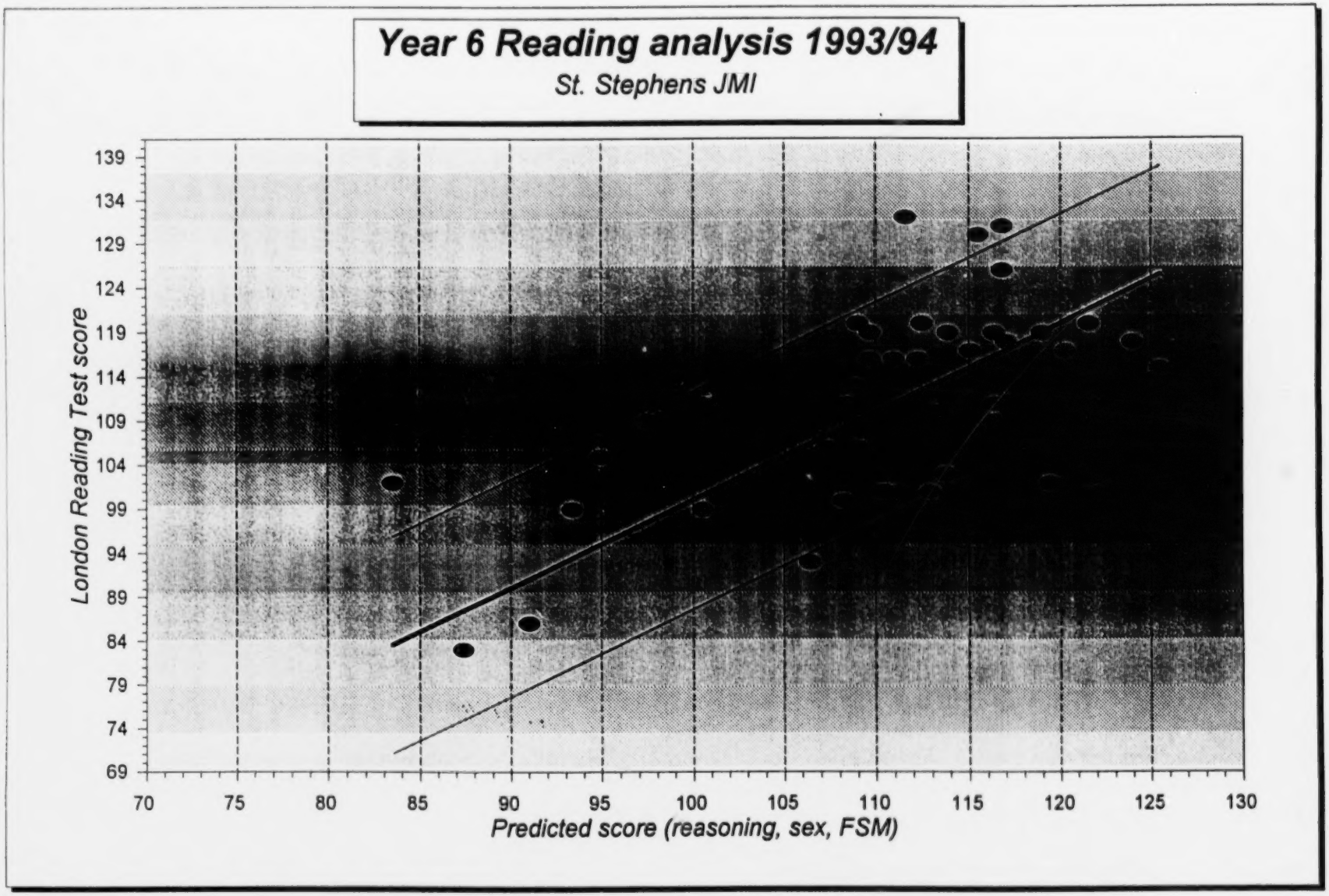
<Insert Figure 2 about here>

In the graph the pupils' predicted reading scores are given along the horizontal axis and their actual reading scores are given along the vertical axis. Each point plotted represents one pupil. There are three diagonal lines across the centre of the graph. The central diagonal line shows the predicted level of achievement for the pupil based upon the whole Wandsworth year 6 group (approximately 2,000 pupils). Most pupils will be achieving at or around the level expected for their age and ability and a criterion to identify significant divergence from expectation needs to be set. A difference greater than one standard error has been selected and is represented by the upper and lower diagonal lines. Where the vertical distance from the centre line places the pupil above or below the outer diagonal lines attainment is significantly above or below expectation.

For St. Stephen's it is clear that:

- predicted reading scores are above the national average (100) for all but six pupils and therefore expectations for pupil attainment need to be high;
- the vast majority of pupils are achieving at the high level that would be expected given their age, sex, reasoning score and free school meal entitlement; that is the difference between their actual and predicted scores does not place them above or below the outer diagonal lines of the graph;

[2]. *There is insufficient time to describe the process in detail. Full details of the rationale and methodology can be found in Strand (1993).*



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- the above results can be quantified into a target for reading attainment at each school defined not by reference to borough or national averages but by the characteristics of the pupils attending that particular school. For St. Stephen's the average predicted reading score is 110.2, closely matched by the average actual reading score of 110.7;

- there are very few pupils who attainment is significantly below the expected level, only two pupils are identified as underachieving.

I have presented here an example from only one school. The complete analysis across all schools indicates that pupils of similar age, ability, sex, and level of social disadvantage can and do achieve markedly different levels of attainment dependent on the school they attend, i.e., schools do make a difference. This finding will be no surprise to readers of the school effectiveness literature (e g., Mortimore et. al., 1988; Goldstein & Nuttall, 1989; Smith and Tomlinson, 1989). The growth of such quantitative analyses of school effectiveness has been marked in recent years, as indicated by the fact that there are no fewer than five symposiums on such research planned for this year's conference.

Analyses such as those described for the year 6 attainment tests are being extended within the LEA as pupils are tracked throughout their time at school. For example we are currently completing a similar analysis of the summer 1995 KS1 tests, although expectations are based upon the pupils' prior attainment in the 1992 Baseline assessment rather than non-verbal reasoning scores.

Annual School Reviews (ASR)

While the research programme detailed above refines the role of the KPIs in setting appropriate expectations for schools' achievements and in evaluating their achievements, I have still not described the mechanism through which the LEA attempts to secure improvements in school performance. In Wandsworth this happens through a programme of Annual School Reviews (ASRs) which link the internal processes of self-review with those of external audit and evaluation.

ASRs have been completed in Wandsworth since September 1992. In September 1994 new government arrangements for school inspection responsibility for routine inspection of schools passed to the Office for Standards in Education (OFSTED). With effect from September 1994 ASRs were therefore modified to become the primary means by which the LEA fulfils its responsibility to monitor the quality of the education being provided by the schools in its area. Since schools will receive an OFSTED inspection only once every four years, the ASR provides schools with the opportunity to participate with the Inspectorate in a more frequent and systematic assessment of their progress.

The ASR process has four purposes:

- a summary of standards of pupil attainment at the school;

- a detailed annual evaluation of the progress made by a school;

- a review of the schools systems for securing improvement;

- setting measurable targets for the coming year.

An inspector from the LEA team carries out the review which involves the inspector in five days of activity, including approximately two days in the school. The KPI form has a central focusing role in the review by pulling together quantitative information on the school. Other sources of information are sought including the school development plan, the previous years' targets, head's reports to governors, curriculum analyses and the staffing structure, the SEN policy and other evidence of pupil attainment and behaviour drawn from within the school. The most significant outcome of the ASR is a future improvements action plan. The Head and the inspector agree four or five targets for the coming year, and agree appropriate success criteria and sources of evidence. Monitoring activities for the review are agreed with the head, and these may involve the inspector in lesson observation, reviews of pupils' work or the setting and monitoring of tasks with individuals or small groups of pupils (e.g., assessment of pupils higher-order reading skills such as use of the reference library).

For example in an early ASR for St. Stephen's, the KPI form highlighted the fact that KS1 results in each of the three core subjects were significantly below the national average and lower than might be expected from the school context factors. In conjunction with the inspector the Head agreed a target to improve pupils' attainment at KS1 and drew up an action plan to address the issue. The plan included modifications to the role of co-ordinators to include responsibility for monitoring progression, continuity and standards in their subject across the school, identification of staff in-service training (INSET) needs, and the related financial implications. The plan was discussed and agreed at whole school level and supported by termly monitoring procedures suggested by the inspector. Subsequent KS1 results improved markedly in most areas. However assessment results for writing continued to be lower than might be expected and this area became one of the targets in the following year's ASR.

In summary, the ASR is the way Wandsworth LEA approaches the complex task of integrating external inspection with internal self-evaluation. Riley & Nuttall (1994) suggest that without the contribution of external validation schools find it difficult to initiate or sustain improvements, continuing to do what they have done in the past. At the same time it has been argued that effective action needs to centre on schools' own objectives. For improvement to take place the school's own agenda has to match up to the external agenda. In Wandsworth this link is achieved by focusing on the relationship between the key performance indicators and the school development plan, mediated by the professional judgements of the Inspector and the Head. The way in which PIs are viewed is crucial in this regard. In Wandsworth the KPIs are viewed as raising questions about areas for closer investigation rather providing a judgement about whether a school is 'effective' or 'ineffective'. The analogy provided by Carter (1989) is informative. Carter argues that one view of PIs equated them to 'dials', similar to those on the dashboard of a car, which would provide clear and unambiguous measures of output. However, as Nuttall (1994) observes, a dial pointer moving into the red is only a symptom of some malfunction and further investigation is needed to establish its cause. Measures of performance may more aptly be described

as 'tin-openers' which open up a 'can of worms' leading to further examination and enquiry (Carter, 1989).

The audience for the KPIs

In the above I have described the audience for the KPIs as inspectors and heads. However there is another significant audience for the KPIs and that is school governors. I mentioned earlier that the emphasis of the KPI scheme is on the accountability of schools for their performance. School governors are clearly an important part of the equation for accountability. The KPI form is attached as an appendix to the ASR report and circulated to all governors. Training sessions have been held for governors on how to interpret and raise questions from the KPI. The sessions have been well attended and governors have welcome the information.

Conclusion

In conclusion, the LEA believes the KPI scheme has the following benefits, it:

- focuses attention on key educational outcomes for pupils;
- supports heads in the management of their schools;
- through the research programme evaluates the school's achievements in relation to expectations defined by the characteristics of the pupils attending that school rather than purely through reference to Borough or national averages;
- through the ASR focuses on the mechanisms by which improvements in outcome PIs can be achieved via a process of target setting, including the specification of success criteria and sources of evidence;
- improves accountability by empowering governors to ask relevant questions of the school's management.

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